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CONSERVATION OF BIOLOGICAL DIVERSITY

OPTIONS FOR AGENDA 21

Chairman's Summary and Proposals for Action

Introductory remarks

1. At this stage of preparation of Agenda 21, and as with the various other issues of the Working Group under discussion, two main considerations appear to emerge as background to the further work of the Working Group on the proposals made for amending document A/CONF.151/PC/42/Add.4:

(a) It is not yet possible to define with precision the exact shape of Agenda 21. Major interlinkages have not been clarified; costing exercises have not yet been carried out; negotiations are proceeding elsewhere on a Convention on biological diversity; essential cross-sectoral issues such as financing and transfer of technology are still to be discussed in the plenary; and institutional aspects will be considered by Working Group III, among other things. In particular, the crucial integration of development and environment into a coherent action framework cannot yet be finalized.

Notes:

Underscore indicates proposed new language to the original text as contained in document A/CONF.151/PC/42/Add.4. [Square brackets] indicates proposed deletions from the original text.

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(b) It is nevertheless of crucial importance for negotiations of the various elements of Agenda 21 to be taken as far as possible at this third session of the Preparatory Committee. All agreements remain provisional and ad referendum at this stage: final agreement will be possible only when the shape and structure of Agenda 21 as a whole is known. But it is possible even at this stage to start preparing the building blocks. It is therefore essential for Governments to be able to negotiate firm texts to clarify areas of agreement and to identify areas requiring further negotiation.

2. This paper is intended to set the stage for the negotiation and to provide a firm background for the negotiating texts. Part I is a summary of the main points that emerged from the debate on A/CONF.151/PC/42/Add.4. This text is not submitted for negotiation. It remains background material on the Chairman's own responsibility.

3. Part II contains suggestions for possible revisions to A/CONF.151/PC/42/Add.4, which when read alongside the original document, are intended to provide a preliminary draft text to be negotiated. Informal consultations in various forms would help to facilitate agreement as far as possible during the session of the Preparatory Committee.

PART I

BACKGROUND COMMENTS ON THE POSSIBLE REVISIONS TO THE PROPOSALS CONTAINED IN A/CONF.151/PC/42/Add.4

4. The stimulating discussion on A/CONF.151/PC/42/Add.4 indicated general support for the overall structure of the document, which should be able to accommodate most - if not all - of the comments made in the debate. However, many comments were made on the content, and a number of amendments were proposed to specific programme areas. The proposed revisions in Part II of this document are provided in an attempt to accommodate these with the purpose of facilitating the negotiation of an agreed text. It is regretted that in the time available it has not been possible to reproduce the entire text of the document.

5. Several general points emerged on the overall content of the document:

(a) The obvious links with the negotiating process for a convention on biological diversity were underlined, with special emphasis on the care needed to avoid duplication or pre-empting the outcome of the negotiations. The Chairman of the Intergovernmental Negotiating Committee for a Convention on Biological Diversity drew attention to the close links already established between the secretariat of the INC for a Convention on Biological Diversity and the UNCED secretariat and indicated his view that the proposals in A/CONF.151/PC/42/Add.4 supported and were complementary to the negotiating process. Nevertheless, further development of the document will clearly need to take careful account of the negotiating process for a convention;

(b) At the same time, there was a strong call for immediate action, with several of the proposed target dates questioned as being too late;

(c) The need to develop Agenda 21 on the basis of existing and planned activities, including those undertaken by UNEP and other partners, was emphasized;

(d) It was understood that national sovereignty needs to be respected and that this should be fully reflected in the proposed activities. Biological resources of a country are under its sovereignty and in this respect are not to be considered as a common heritage of humankind;

(e) The importance of action at the national level was strongly emphasized. A "top-down" approach should be avoided and programmes should emphasize capacity-building at local and national levels. Indigenous peoples, women and children and farmers' rights were matters of special concern;

(f) As with other sectoral issues, much emphasis was laid on the need for the developed countries to assist with additional funding for genetically-rich developing countries, in particular to assist them to meet opportunity costs foregone;

(g) It was generally recognized that Agenda 21 on conservation of biodiversity should give greater emphasis to the relevant aspects of biotechnology and to related technology transfer;

(h) Although the Working Group is working on the theme of the Conservation of Biological Diversity, there was a call from many countries to enlarge the proposed activities to incorporate more emphasis on sustainable use and development;

(i) More attention needs to be given to the issue of marine biodiversity, with particular reference to coral reefs and their ecosystems.

6. A number of comments were also raised on specific programme areas:

(a) There was general support for Programme A - Provide information on biodiversity. It was stressed that as neither biodiversity nor its potential benefits are adequately understood, its conservation and sustainable use can only be achieved through better information, research and monitoring, based on national efforts with the support of the international community;

(b) It was considered that Programme B - Maximize and spread the benefits of biodiversity - would require more elaboration on sustainable use;

(c) On Programme C - Improve the conservation of biological resources - the primary importance of in situ conservation was underlined but at the same time it was stressed that it could not be confined to traditional protected areas: new forms of land management are required. Furthermore, the proportion of protected land should not be limited to a fixed percentage, since the nature of the land concerned needs to be considered;

(d) On Programme D - Enhancing the capacity to manage biodiversity - many delegations stressed the key significance of ensuring adequate institutional capacity - especially within developing countries - for raising awareness, and developing human resources, research and training, and information facilities.

PART II

CONSERVATION OF BIOLOGICAL DIVERSITY: OPTIONS FOR AGENDA 21

I. INTRODUCTION

1. At the second session of the Preparatory Committee for the United Nations Conference on Environment and Development the Secretary-General of the Conference was requested to report to the third session of the Preparatory Committee on the operational requirements for the conservation and sustainable use of biological resources, including genetic resources, and on the relationships between biological diversity (biodiversity) and relevant aspects of biotechnology, climate change, and forests (decision 2/9, GA A/46/48 (Part I)). This work should take into account views of the Preparatory Committee on cross-sectoral issues, related in particular to environment and development, the elimination of poverty, and the transfer of financial resources and of technology, including biotechnology. Care is being taken to support the negotiations of a convention on biological diversity.

2. In preparing this report, the UNCED secretariat has continued to work closely with the relevant agencies of the United Nations system and with other members of the informal ad hoc Working Party on Biodiversity, whose helpful and constructive support has made an indispensable contribution to this report. The report in particular reflects useful input from the Food and Agriculture Organization, the United Nations Environment Programme, the United Nations Educational, Scientific, and Cultural Organization, the International Board for Plant Genetic Resources, the Secretariat of the Intergovernmental Negotiating Committee on Climate Change, the International Union for Conservation of Nature and Natural Resources. Input was also received from Genetic Resources Action International (GRAIN), the Indigenous Peoples' Commission, the International Union of Biological Sciences, the World Resources Institute, and the World Conservation Monitoring Centre. The work of other non-governmental organizations such as Conservation International and the World Wide Fund for Nature was also taken into consideration.

3. This paper suggests possible response options for Agenda 21. Addressing the most critical issues regarding the effective conservation of biodiversity will require a major shift in thinking at all levels of policy-making. This will need to be supported by a commitment to stepping up levels of human, financial, and other resources [required to bring about a] <u>allocated toward a more</u> concerted and coordinated international effort. The options set out in this paper are intended to assist the Preparatory Committee in determining priorities. Much valuable work is already in hand at the global, regional, and national levels, and the options in this paper are designed to build upon and coordinate these, as well as to address the many gaps and weaknesses. In particular, they are intended to complement and reinforce the negotiating process for a convention on biodiversity, as well as to assist in its implementation.

4. Finding new ways [of raising the large amounts of funds implicit in] to allocate sufficient funds for addressing the options will need to be found, especially for capacity-building in the developing countries. This paper addresses some of the issues raised by these needs. Others are dealt with in the cross-sectoral paper on financial resources.

The linkages between Biodiversity and other Environmental and Developmental Issues

5. Success or failure in achieving the objectives set out in paragraph 7 will have major repercussions on the development process. With the exception of mineral extraction, all primary producing sectors depend heavily on a continuing and plentiful supply of biological resources. The conservation of biodiversity, especially genetic diversity within species, is one key to the world's food security through improved crop production, horticultural and animal husbandry techniques, and aquaculture. Human health and welfare also benefit from the use of wild plants and animals for pharmaceutical products. In their turn, the activities of the primary producing sectors have a major influence on the stock of biological resources. With the major exceptions of biotechnology and tourism, both of which have major stakes in the conservation and sustainable utilization of those resources, the intermediary producing sectors rely less heavily on biodiversity. As the techniques for attaching economic values to those resources and for incorporating them into national accounting processes evolve, their key role in the international economy seems likely to become increasingly evident. At the same time, the maintenance of ecosystem functions, in particular for soil and water conservation, is based on the careful management of their biological resources and plays a major role in maintaining environmental quality.

6. There are also major cross-linkages between biodiversity and the following issues:

(a) Climate change, (including drought) with particular reference to possible changes in the distribution of species and habitats, [contributes] could contribute to genetic erosion, losses of biological resources vital to human welfare, and threatens the viability of certain protected areas, while possibly enriching or enhancing other habitats.

(b) Forests, especially tropical forests, act as habitats for much of the world's terrestrial biodiversity, and [the extent to which its depletion will affect local climates] diminution of their size and quality can affect a wide range of environmental services, as well as local climates.

(c) Oceans and coastal areas, including the land-sea interface represent areas of high biodiversity, endemism, variability, and recruitment, contributing to the regulation of greenhouse gases, the supply of food, and the protection of coastal areas, including coral reefs, coastal vegetation systems, mangroves.

(d) Biotechnology, in which new and improved techniques for preserving and utilizing genetic resources will play a key role in food security, human health and welfare, industrial processes, and which is based on biodiversity.

(e) Land resources, in which diversity of soil organisms plays an important function in maintaining the fertility of the soil for agriculture as well as for natural ecosystems.

(f) Freshwater, in which the diversity of biological resources, may offer a significant potential for developing improved freshwater species for meeting many human needs.

(g) Population and social dynamics exert pressures on numerous natural ecosystems, reducing habitats and contributing to the loss of biological and genetic resources, which in turn diminishes the resource base to provide for human needs; at the same time the traditional knowledge of indigenous populations is often the most effective way to conserve biodiversity and to use biological resources on a sustainable basis.

(h) Environmental education, where the study of biodiversity is often an important starting point.

CONSERVATION OBJECTIVES FOR BIODIVERSITY

7. In pursuing the decision of the Preparatory Committee, the UNCED secretariat has identified a number of options for action which could be used as a basis for a contribution to Agenda 21. The Options for Action focus upon four principal objectives which respond to the needs identified in the Background and Issues Paper (A/CONF.151/PC/66). These are intended to complement and support the negotiations on a convention on biological diversity, [as follows:] There is no time to lose in taking effective action to maintain and sustain the life support and productive capacities of the Earth's biota for present and future generations. Nations, acting individually and with appropriate support from international organizations, should without delay, therefore seek to:

(a) Establish a global programme by the year [1995] to ascertain the extent of the Earth's biological resources.

(b) [Move biodiversity concerns into the mainstream of national and international policy-making by the year [1995].] Integrate biodiversity considerations fully into national and international policy-making and decision-making.

(c) Stabilize the depletion of biological resources at [natural levels] and ecosystem diversity and functions in non-tropical regions by the year [2010] and in tropical regions by the year [2025].

(d) [Promote the use of biological resources to enhance sustainable development.] Promote sustainable development through the sustainable use of biological resources.

(e) Endeavour to reduce the risk that human activities will cause long-term adverse effects upon natural ecosystem processes.

II. OPTIONS FOR AGENDA 21

Proposed Programme Areas

8. The continuing erosion of the Earth's biological resources could pose grave risks for the future well-being of humankind. Without an abundant diversity of living things to serve as reservoirs for genetic diversity, the rate of development of new crop varieties may slow down considerably. These new varieties are needed to increase food production, [ward off] control pests and diseases, and to cope with possible climatic changes. Furthermore, a great store of genetic diversity is also required by the emerging food and pharmaceutical biotechnology for the improvement of agricultural products and yields and the development of new medicinal drugs. At the same time, the adequate protection of ecosystems and landscapes and their maintenance are essential for soil and water conservation and sustainable development.

9. The suggested programme area options set out below address the main problem areas in a concerted manner, building upon current activities and programmes at the global, regional, national, and local levels and addressing the many gaps in knowledge. They constitute an integrated strategy to save, study, and use biological resources to promote sustainable development. The proposed options could be implemented in a coordinated manner as a package, since they are mutually interdependent.

A. Provide information on biodiversity.

Develop more effective procedures for assessing, studying, and monitoring biological resources to assist planning and decision-making.

B. Maximize and spread the benefits of biodiversity.

Develop and apply policies for realizing the full potential benefits and sustainable use of biological resources, including genetic resources.

C. Improve conservation of biological resources.

Strengthen and augment on-going activities for conserving biological resources.

D. Enhance the capacity to manage biodiversity.

Build up the educational, training, [and] institutional framework and economic and financial mechanisms for the conservation and sustainable utilization of biological resources.

A. PROVIDE INFORMATION ON BIODIVERSITY

Basis for Action

10. Major gaps and weaknesses exist in the capacity of existing national and international mechanisms to assess, study, and monitor biological resources. More effective approaches are required to understand [on] the status of

existing species and ecosystems, as well as [about] the distribution, variation patterns, economic uses, biology and genetics of priority species, and on their interrelationships. Some of these may call upon [anthropological] research on indigenous uses of biological resources, [and] the role of women, and the rights acquired through breeding practices by traditional farmers. This is especially important to enable economic values to be ascribed and biodiversity to be fully integrated into economic and related policy-making at every level. It is also important that the processes of target-setting, monitoring, and reporting be open to public scrutiny and the results widely disseminated.

11. More scientific research is required to assess the status of biodiversity at the species level and to evaluate its role in the functioning of ecosystems. Research is needed to improve understanding of the environmental services and values provided by ecosystems and the role of those services and values in supporting sustainable economic activities and development. Research is also needed on the interaction of economic incentives and property rights arrangements with biodiversity, as well as on the linkages of biodiversity with poverty and the relevant aspects of biotechnology. Research is also required to provide for food production which do not pollute surface and groundwater, degrade and erode top soil, or reduce species and ecosystem diversity. Major knowledge gaps exist especially on:

(a) Biological implications of possible global climate change, notably the relationship of ecosystem structures and functions to overall atmospheric and hydrological processes at the global and regional level;

(b) The effective protection and maintenance of varieties, species, populations, and communities, in representative ecosystems;

(c) The sustainable management of landscapes and ecosystems, taking account of all costs and benefits, including social and environmental costs and benefits.

(d) The role of diverse soil organisms in maintaining the productivity of agricultural systems.

12. The need for surveys, inventories and validation of key elements of biodiversity; conservation technologies related to the sustainable use of biodiversity; and the regular monitoring of the status of the world's biodiversity have been identified among the priority areas in need of costing and funding under a possible convention on biological diversity.

Objectives

13. The following targets, which will need to be synchronized for maximum speed and effectiveness, are envisaged. They should, wherever possible, build upon existing or planned activities. Since the major part of this work will need to be undertaken in developing countries, adequate support should be provided to them for carrying out the necessary work and for participation in regional and global efforts.

(a) By the year [2000] undertake national surveys and a coordinated global survey to establish baseline assessments of [biological resources] biodiversity and to define priority areas for its protection.

(b) Develop a global monitoring system, building upon existing mechanisms, to be completed by the year [2010];

(c) Evaluate the role of biodiversity in the functioning of the world's major ecosystems and landscapes by the year [2010].

Activities

14. National Governments, with the cooperation of [international non-governmental and] relevant intergovernmental and non-governmental organizations, and appropriate agencies of the United Nations, could undertake national surveys to establish baseline information on their biological resources terrestrial, aquatic, coastal, and marine. A coordinated survey of the world's biota could be coordinated by the United Nations system. The following are some of the more specific activities.

(a) Consolidate existing information on biodiversity and make it widely available throughout government and to the public.

[(b) Harmonize existing and planned programmes and activities such as UNEP's "GEMS", UNESCO's Biosphere Reserve Network. FAO's Global Information and Early [Warming] Warning System on Plant Genetic Resources, ICSU/IGBP's "START", among other relevant programmes, to coordinate the survey initially in a limited number of countries.]

(b) Develop cost-effective methodologies for inventories of biological resources and for rapid assessments of biodiversity.

(c) Undertake statistical sampling of biological resources and assessment of genetic variation, and possible economic values, in countries by multidisciplinary teams of specialists.

(d) Input information into a new computerized biodiversity information system, building upon existing facilities such as the World Conservation Monitoring Centre and provide assessments on a regular basis.

(e) Continue in parallel rigorous taxonomic work in museums, herbaria and other specialized institutions to [refine and increase] improve the precision of the survey estimates.

(f) Building upon current country studies undertaken under UNEP's leadership, evaluate potential economic implications of protection and use of identified elements of biodiversity in each country.

(g) Enabling mechanisms: Ways and means will need to be identified to ensure funding and technology transfer consistent with United Nations General Assembly resolution 44/228, with a view to fulfilling the objectives of the Conference, in particular those stipulated in Section I, paragraph 15, sections (j) and (k).

15. [The] As a basis for information and as a tool for management at local and national levels, the international community in general could establish a global system for monitoring quantitative and qualitative changes in biodiversity, with the collaboration of national Governments and institutions, intergovernmental and non-governmental organizations, under the guidance of appropriate United Nations organizations and building upon local knowledge. The following is a non-exhaustive list of specific activities that might be incorporated in such a system.

(a) Establish, on the basis of available knowledge, a world classification of biogeographic provinces for the conservation of biodiversity.

[a](b) Identify and harmonize appropriate methodologies and main data elements for monitoring the status and condition of different habitats, using remote-sensing techniques, [and] geographic information systems and cartographic methods as appropriate.

[b](c) [Establish] Develop a network of ground stations for monitoring [biodiversity] changes in ecosystems, using where appropriate the potential offered by the international network of Biosphere Reserves; the network could also be used for the calibration and validation of remote sensing monitoring.

[c](d) [Input] Collate information [to a computerized system] obtained from traditional knowledge at grass-roots level, with support from parataxonomist teams, to assess the effect of land use changes on biodiversity.

16. Major and long-term research efforts could be launched into elaborating on the importance of biodiversity, at different scales, for the functioning of ecosystems [and on the response of different ecosystems and landscapes to human disturbance] the role of ecosystems in producing goods, environmental services, and other values supporting sustainable economic activities and development. This research should include such areas as: biology and reproductive capacity of key endemic plant species; new observation and inventory techniques; social behaviour and nutrition habits; ecological conditions necessary for biodiversity conservation and continued evolution; etc. Special consideration could be given to those areas where there is a direct dependence on natural resources and where women play an important role in ensuring food security, as well as involving indigenous peoples in conservation, use, and research efforts. This work could be coordinated by national Governments, with the cooperation and collaboration of non-governmental organizations, research institutions, and appropriate programmes and organizations of the United Nations, building upon the IUBS/SCOPE/UNESCO programme "Ecosystem Function of Biodiversity".

B. MAXIMIZE AND SPREAD THE BENEFITS OF BIODIVERSITY

Basis for Action

17. The world's biodiversity has enormous potential for meeting many needs today and in the future. In the absence of a clear understanding and demonstration of the benefits of biodiversity however, insufficient financial and human resources have so far been invested in its conservation and sustainable use. By regarding biodiversity as a capital resource base, which

will produce a sustainable yield of benefits, conservation of biological resources could become an opportunity for investment rather than an additional burden on national budgets. Most policies and laws affecting biological resources were not designed with conservation and sustainable use of biodiversity in mind; many national policies are designed explicitly to facilitate the depletion of some species and varieties utilized by farmers and the degradation of ecosystems. Other policies have significant indirect and unplanned side-effects. [A wide range of policies and laws will therefore need to be reassessed and reformed.]

18. A number of [market failures] indirect effects of market practices present major obstacles to the effective conservation and use of biodiversity because many biodiversity values fall outside normal market mechanisms and processes, and are not taken into account by market participants. [First, many biological resources are consumed directly, and therefore do not enter markets. Second, much] Much of the benefit provided by biodiversity is in the form of public goods, so many users of biodiversity can "free ride" on the conservation investment of others. Third, the maintenance of ecosystem functions such as soil and water conservation and sustainable use are not taken into account. Last, some values of biodiversity - aesthetic and spiritual values in particular - are intangible, and therefore not reflected in the market place yet these ethical, social, and cultural dimensions of biodiversity are of utmost importance to all nations.

19. At present national income accounts do not consider biological resources as capital, but instead equate activities resulting in biological resource depletion with net income. This is then reflected in the design of sector-specific activities and projects. Methods need to be developed to quantify the direct and indirect values of species of forests, grasslands, wetlands, coastal and marine ecosystems, and the genetic diversity of agricultural plant and animal species. Such valuation is a prerequisite for the consideration of biodiversity as an important economic asset in the policy-making process.

19a. Recent advances in biotechnology have demonstrated the important use which could be made for agricultural, industrial, health, and welfare purposes of the genetic material contained in plants, animals, and micro-organisms. The conservation and use (including profits resulting from biotechnology products) of these genetic resources, which are particularly abundant in tropical countries, constitute a major challenge for international cooperation between developed and developing countries and also among developing countries.

20. The need to coordinate conservation management strategies and plans with sustainable development policies has been identified as one of the priority areas in need for costing and funding under a possible convention on biological diversity.

Objectives

21. Efforts need to be concentrated on the following targets. They should wherever possible build upon existing or planned activities:

(a) Build local, national and international policies which support biodiversity.

(b) Broaden the base for slowing the loss of biodiversity, through a greater role for local and indigenous communities, particularly women, children, and non-governmental organizations.

(c) Develop a supportive framework of international agreements, funding mechanisms, and institutional capacity.

Activities

22. National Governments (from both developed and developing countries), intergovernmental organizations, and international development and financial organizations, could incorporate national commitments on biodiversity into development policies. Biodiversity considerations need to be taken into account in general policies relating to financial resources, technology transfer, debt, trade, environmental accounting, and the use of economic instruments which are dealt with in other documents. More specific activities of this programme are:

(a) Provide maximum support and reinforcement for the negotiation and implementation of relevant existing or proposed international instruments, with particular reference to a convention on the conservation and sustainable use of biodiversity.

(b) Review and reform national policies and trade practices which provide incentives for unsustainable use of biological resources.

(c) Develop a [framework of methodologies] methodological framework for ascribing economic values and for quantifying the contribution of biological resources and ecosystem functions to national economies. (See Environmental Accounting document, A/Conf.151/PC/49).

(d) Develop a process for meaningful and constructive dialogue among all actors, [including indigenous people,] involved in the biodiversity policy reform agenda, including conservers and users, indigenous people, universities, all sectors of governments, non-governmental organizations, business, local community groups, women and other social groups.

(e) Integrate biodiversity concerns, potential benefits and opportunity costs calculations into project design, implementation, and the evaluation processes of multilateral and bilateral development agencies, and other types of assistance, e.g. structural adjustment.

(f) Develop national biodiversity strategies or action plans as part of wider economic planning, elaboration of legislation, and allocations of new and additional funding from national and international sources.

(g) Increase significantly the level of support for research into the use of biological resources, specifically genetic resources, especially for national crop and animal breeding programmes [and] as well as pharmaceutical products (including those provided by traditional medicine).

(h) Agree on an international [code of conduct] for collectors of biological resources, including genetic material, recognizing rights of the State, indigenous peoples, [community] communities, and [individual] individuals, including those of women, and the concept of farmers' rights, as identified in the International Undertaking on Plant Genetic Resources.

(i) Strengthen existing funding mechanisms and new mechanisms [established] as necessary to meet short-, medium- and long-term developing country needs related to the conservation and the sustainable use of biological resources.

(j) Continue and promote private and public debt-for-nature swaps, where appropriate.

(k) Encourage the use of trust funds and endowments by national Governments, lending institutions, and non-governmental organizations.

(l) Encourage transnational corporations to assist with spreading the benefits of biodiversity to developing countries.

(m). Enabling mechanisms: Ways and means will need to be identified to ensure funding and technology transfer consistent with UNGA resolution 44/228, with a view to fulfilling the objectives of the Conference, in particular those stipulated in Section I, paragraph 15, sections (j) and (k).

C. IMPROVE THE CONSERVATION OF BIOLOGICAL RESOURCES

Basis for action

23. Threats to biodiversity are many and varied, ranging from the overexploitation of biological resources; the destruction of habitats; the devaluation of traditional knowledge systems; the inadequate recognition of women's contributions; the neglect of primitive and rare varieties; the extermination of wildlife; pollution and climate change; to activities resulting from urbanization; mechanization of agriculture spread of monoculture and in substitution over agricultural systems; excessive use of pesticides; overfishing; clear-cutting of forests; as well as global trade policies. Despite the efforts over the past 20 years, the loss of the world's biodiversity has continued.

24. The most effective way to conserve biodiversity is through in situ protection of ecosystems, where the diversity of species and their genetic variation may be preserved. Ex situ conservation of biological resources can only make use of that diversity. In situ conservation allows the necessary interaction among individuals of the same and different species, within ecosystems. This interaction forms the basis for natural selection that creates the diversity of biological resources. Ex situ conservation of genetic resources is complementary to in situ conservation and should therefore be closely linked to it. In situ conservation can be achieved through different forms of ecosystem management, according to the specific conservation objectives which are sought.

25. Genetic resources have generally been made available, mostly without restriction or charge. Plant and animal genetic resources provide the basic raw materials to adapt crops to changing biological and other stresses, changing consumer preferences and to possible changes in the global environment. Crops will need to be adapted to sustainable forms of agriculture while maintaining increased productivity to feed an expanding global population. The basic elements of an institutional framework for the conservation of plant and animal genetic resource is in place at community, national, regional and global levels. However, a serious lack of funds and a need for improved institutional structures and implementation mechanisms exist at all levels. In some developing countries, this requires the reduction or abandonment of some activities and thus protection of biological resources represents high opportunity costs. The issue of property rights and other kinds of rights over plant and animal [genetic resources of developing countries is increasing in importance] varieties has been raised in the GATT/TRIPS negotiations.

26. The need for management strategies and plans for in situ conservation of biodiversity has been identified as one of the areas in need of costing and funding under a possible convention on biological diversity.

Objectives

27. The proposed programme incorporates the following targets, and wherever possible, could be built upon existing or planned activities:

[(a) Consolidate and strengthen systems of protected areas to reach 10 per cent of the global land cover and appropriate targets for other vulnerable ecosystems such as coral reefs, coastal vegetation systems, and mangroves by the year [2010].]

(a) Consolidate and strengthen systems of protected areas to cover an appropriate portion of each biogeographic province of the global land cover, including temperate, arid and semi-arid areas and tropical savannahs, as well as appropriate targets for other vulnerable ecosystems such as estuaries, coral reefs, coastal vegetation systems, including mangroves and marine sanctuaries by the year [2010].

[(b) Strengthen conservation of species and genetic resources.]

(b) Strengthen conservation of species and genetic resources and ensure that the extinction of important species is halted by the year [2000].

(c) Take specific measures to promote regional approaches where appropriate to conserve biodiversity.

(d) Promote a balance between demographic and social pressures and natural ecosystems.

Activities

28. The following activities could be implemented by national Governments, with the collaboration from non-governmental and intergovernmental organizations, international financial and lending institutions, and with the guidance of relevant agencies and programmes of the United Nations system.

29. The protected area network could be consolidated, as follows:

(a) [Increase the size of the global network of terrestrial protected areas to bring at least 10 per cent of the Earth's land surface within the protected area system by the year [2010].] Increase the size of the global network of terrestrial protected areas so that all areas identified as important for biodiversity within each biogeographic province of the Earth's land surface are protected by the year [2010].

(b) [Launch a major programme to identify vulnerable] Coordinate and expand major programmes to identify vulnerable coastal ecosystems (terrestrial and marine) and establish coastal protected areas, including coral reefs, mangroves, and coastal vegetation systems by the year [2010]. (See the Oceans document, A/CONF.151/PC/42/Add.6)

(c) Provide support to enable all protected area systems to become financially sound, including revenue enhancement measures and appropriate development within buffer zones.

(d) Take measures to enable local communities to earn benefits from protected areas.

(e) [Promote in situ conservation of wild relatives of cultivated plants and domesticated animals on a systematic basis.] Promote in situ conservation of indigenous crops, wild relatives of cultivated plants, and domesticated animals, on a systematic basis, with special emphasis on centres of origin of agricultural plants and animals.

(f) Develop national and local policies, both regulatory and economic, in each country to [manage] encourage the management of private lands as protected areas.

(g) Develop national systems of protected areas to conserve biodiversity.

(h) Take action to support non-governmental organizations and private land owners, in particular women, farmers, and indigenous people, who manage key sites for biodiversity.

(i) Collect data to integrate population and societal trends relevant to protected area management.

(j) Strengthen and broaden existing international and regional instruments to conserve biodiversity.

(k) Enabling mechanisms: Ways and means will need to be identified to ensure funding and technology transfer consistent with United Nations General Assembly resolution 44/228, with a view to fulfilling the objectives of the Conference, in particular those stipulated in Section I, paragraph 15, sections (j) and (k).

30. Conservation of species and genetic resources of importance could be strengthened with the cooperation of national Governments, research institutions and academia, other non-governmental and intergovernmental organizations, lending and financial institutions, and the relevant organizations and programmes of the United Nations. [Activities could include:] Subject to negotiations for a convention on biological diversity, activities could include:

(a) Evaluate the implications of intellectual property rights [at local, national, and global level prior to the adoption of decisions in the GATT/TRIPS negotiations.] on conservation and sustainable use of biodiversity at local, national, and global levels.

(b) Strengthen the legal and institutional framework to fill the gaps, including the establishment of an intergovernmental body for the conservation and sustainable use of plant genetic resources, possibly building upon the FAO Commission on Plant Genetic Resources.

(c) Promote mechanisms to enable the participation of local communities, including farm communities, in the formulation and implementation of national plant and animal genetic resources programmes, to enhance the linkages between the formal and informal sectors.

(d) Strengthen existing facilities and develop improved technologies for reducing germ plasm deterioration during storage, improving regeneration capabilities and for reintroducing of threatened species into the wild.

(e) Launch a global plant genetic resources collection, evaluation, preservation, and enhancement programme for sustainable advances in crop production countries.

(f) Initiate a global network of genetic resource centres, with particular reference to tree species, shrubs and plants to adapt to potential changes in temperature, precipitation, and ultraviolet radiation.

(g) Take action to ensure conservation and access to globally-important germ plasm collections, including [through] support for existing networks of ex situ collections and gene banks in developed and developing countries.

(h) Strengthen and expand the protection of [wildlife] wild animals and plants in their natural habitat.

(i) Promote the conservation of threatened plants and animals and their reintroduction through aquaria, zoos, botanical gardens, and conservatories and biodiversity centres maintained at national or regional levels.

(j) Take steps to apply the relevant safe and ethical aspects of biotechnology for the conservation and sustainable use of genetic resources.

(k) Develop means to protect biological communities from the impact of invasive and exotic or released species of plants and animals.

31. Since biodiversity cannot be maintained through protected areas alone, specific measures to link protected areas with surrounding landscapes and to enhance ecosystem functions need to be taken to conserve it in cooperation with local populations. In this context, protected core areas should, wherever possible, be interlinked to form ecological networks. Wherever appropriate, protected areas should be used to enhance social and economic opportunities for local communities, who can be the best wardens of their biodiversity: Activities could include:

(a) Plan and implement cooperative regional management programmes in areas critical for their biodiversity value. (See the Forests and Oceans documents, A/CONF.151/PC/42/Add.3 and A/CONF.151/PC/42/Add.6 respectively).

(b) [Provide significant international support to the most important ecological regions for conserving biodiversity.] Mobilize effective international support for all significant ecological regions for conserving biodiversity.

(c) Develop regional approaches to plant and animal genetic resources conservation and utilization. The regional seas approach of UNEP could be used to strengthen programmes on conservation of coastal and marine ecosystems. (See the Oceans document, A/CONF.151/PC/42/Add.6).

(d) Strengthen and improve the Biosphere Reserves Network of UNESCO, to link conservation areas with surrounding ecosystems and landscapes and provide economic and social benefits to their inhabitants.

(e) Identify priorities and promote measures for restoration of ecosystems.

D. ENHANCE THE CAPACITY TO MANAGE BIODIVERSITY

Basis for action

32. Devoted, knowledgeable, and adequately trained personnel [is] are urgently needed to implement the present programme of conservation and use of biodiversity particularly in developing countries. Present training institutions and teaching approaches are insufficient, inadequate, and often irrelevant. Job opportunities in this field are also limited, and many positions are poorly paid and supported. Furthermore, ex situ conservation efforts are directed mostly at crops and domesticated animals, neglecting non-commercialized species. Adequately trained personnel and opportunities are scarce to document traditional knowledge and skills regarding the use and conservation of biodiversity and transmit it to future generations. Public awareness among local people, who are custodians of biological diversity, will enable them to exercise their rights and responsibilities in better protecting and utilizing sustainably their biological resources. The need for technical

assistance and cooperation (for research, education, training, public awareness campaigns, surveys, and inventories) has been identified as one of the several areas in need of costing and funding under a possible convention on biodiversity. (See the Education document A/CONF.151/PC/55).

Objectives

33. This programme has four targets:

(a) [To strengthen existing institutions for the conservation and sustainable use of biological resources.] To strengthen existing national institutional capacities (including academic institutions) to support the conservation and sustainable use of biological resources.

(b) To promote basic and applied research and demonstrations so as to improve the management of protected areas and increase their effectiveness in conservation of biodiversity, particularly through development of surrounding areas.

(c) To produce effective managers of protected areas, personnel for planning and running ex situ institutions, land resources managers and specialists responsible for policy formulation through training.

(d) To raise the level of awareness of the general public, local populations and decision-makers.

(e) To develop appropriate economic and financial mechanisms at national and international levels for the conservation of biodiversity.

Activities

34. National Governments and institutions and [non-governmental organizations,] with the collaboration of appropriate organizations and programmes of the United Nations and non-governmental organizations could launch a limited number of large-scale regional interdisciplinary projects in different parts of the world to demonstrate the sustainable use of biological resources and to promote environmentally sound forms of development. These programme area options could, wherever possible, build upon existing or planned activities. Some of the activities include the following:

(a) Develop public administrations for protected area management and encourage the creation of supportive non-governmental organizations at national level.

(b) Develop and strengthen international, including regional, cooperation on protected area systems.

(c) Collect and document traditional knowledge and skills in resource use in order to pass on to future generations.

(c.bis) Develop appropriate institutions and financial mechanisms for protecting biodiversity by indigenous people using traditional approaches.

(d) Launch post-graduate degree programmes to improve planning and management of national and regional plant genetic resources programmes and to identify research needs.

(e) Develop coordinated graduate and post-graduate research programmes on biodiversity and ecosystems function in [Biosphere Reserves] protected areas including Biosphere Reserves and coastal ecosystems.

(f) [Launch a training programme to support efforts to prepare a global inventory of species.] Launch training programmes for developing countries to quantify, record, and monitor biodiversity conservation efforts and to provide information on biodiversity.

(g) Strengthen regional education and training institutions for protected area management and establish new centres in the regions where they do not exist.

(h) Launch specialized technical professional training programmes to develop expertise in various aspects of ex situ conservation such as germ plasm collection, documentation, evaluation, and conservation.

(i) [Promote professional associations of protected area managers.] Develop educational, training, and supporting institutional capacities, including gene banks and laboratories, for research into the relevant aspects of biotechnology.

(j) Establish regional associations of biosphere reserve managers and other stakeholders in implementing biosphere reserve programmes, for exchange of experience and information.

(k) Set up a programme of field training for specialists in taxonomy and conservation biology.

(l) Set up extension courses and services for local communities [to promote] and encourage their participation in promoting the use of natural resources on a sustainable basis.

(m) Launch education programmes, including those based on the knowledge of indigenous peoples aimed at creating a wider awareness of the role of ex situ conservation among agricultural and other relevant scientists and managers.

(n) Use protected areas for demonstrations of their functions and training, also drawing upon the knowledge of indigenous peoples, to be used as part of outdoor education projects (See Education document A/CONF.151/PC/55).

(o) Enabling mechanisms: Ways and means will need to be identified to ensure funding and technology transfer consistent with United Nations General Assembly resolution 44/228, with a view to fulfilling the objectives of the Conference, in particular those stipulated in Section I, paragraph 15, sections (j) and (k).